

## **YOGHURT FORMULATION COSMETIC COMPOSITION**

This is a national stage application under 35 U.S.C. § 371 of PCT/KR2004/002253 filed on September 6, 2004, which claims priority from Korean patent application 10-2004-0016589 filed on March 11, 2004, all of which are incorporated herein by reference.

### **BACKGROUND OF THE INVENTION**

#### **1. Field of the Invention**

The present invention relates to a cosmetic composition, containing xanthan gum and mannan. More particularly, the present invention relates to a cosmetic composition wherein appearance and texture of curd yoghurt are realized by including xanthan gum and mannan and which can be formulated into a pack or a facial mask.

#### **2. Description of Prior Art**

Yoghurt is a kind of fermented milk and produced by fermenting the sterilized mammal milk with lactic acid bacteria and then by adding spices, sweetening and the like thereto, depending on one's taste, to be suitable for drinking. This yoghurt is generally divided into liquid fermented milk and concentrated fermented milk, which is again divided into "curd yoghurt" which is scooping or squeezing-type and "drinking yoghurt" which is drinking-type.

In recent years, yoghurt has been used as a skin-care pack or mask. This pack or mask forms a temporary film on the face, when applied, to block air inflow and moisture evaporation. Thus, it can soften the skin and enable active ingredients to penetrate into the skin. Various materials have been and are

applied to the pack formulation. Recently, there have been many studies on natural materials which may be suitable for use in a skin-care pack.

Homemade facial masks using foodstuffs such as fruit or powdered grains have been widely done. Particularly, the popularity of yoghurt as a facial mask material is on the increase. Yoghurt has soft texture and contains various vitamins and qualitative proteins, to be expected for skin moisturizing effect and skin softening effect. However, on directly applied onto the skin, yoghurt may trickle down and cause irritations to the skin. On this account, it usually is required to put a gauze on the face, and apply yoghurt on the gauze, which is cumbersome.

Under these circumstances, in order to provide a cosmetic composition having a curd yoghurt texture and to improve applicability of the composition onto the skin, the present inventors have been extensively studied. For the above purpose, we have made many efforts to provide a yoghurt-type pack that can be easily applied onto the skin. We have investigated various polymers and screened the combination thereof in order to realize the same appearance and texture as those of curd yoghurt.

As a result thereof, we found that a combination of xanthan gum and mannan can realize emulsions having the same lumpy texture as that of yoghurt and stability, and thus have completed the present invention. In addition, we confirmed that skin moisturizing and softening effects can be obtained by adding extracts of fruits or vegetables such as strawberry, banana, apple, kiwi fruit, broccoli, berries (blueberry, raspberry, etc.), potato, carrot, melon, pineapple and peach; said fruit or vegetable crushes; or milk, vitamins or yoghurt powder. Also, we confirmed that addition of the extracts can improve fragrance and feeling of the cosmetics.

Therefore, an object of the present invention is to provide a cosmetic composition which has a similar appearance and texture to those of curd

yoghurt.

Further, another object of the present invention is to provide a cosmetic composition with skin moisturizing and softening effects, containing fruit or vegetable extracts, or milk, vitamins or yoghurt powder.

A further object of the present invention is to provide a cosmetic composition in a pack formulation, which can be directly applied onto the skin without an additional treatment.

### **SUMMARY OF THE INVENTION**

The cosmetic composition according to the present invention is characterized in that it contains xanthan gum and mannan. That is, the present invention provides a cosmetic composition with curd yoghurt-type pack formulation by containing xanthan gum and mannan.

More particularly, the xanthan gum and mannan may be incorporated into an emulsion-type cosmetic composition, so as to realize appearance and texture of yoghurt in the cosmetic composition.

The xanthan gum and mannan may be employed in a ratio of 1:4 to 4:1 by weight. Within the range, the obtained texture may be the most similar to that of yoghurt and formulation into a pack can be easily processed.

Additionally, the present invention provides a cosmetic composition with appearance and texture of yoghurt realized by containing xanthan gum and mannan. Particularly, the cosmetic may be formulated into an oil-in-water emulsion. More particularly, it may be formulated into a pack or facial mask.

The cosmetic composition according to the present invention may contain one or more selected from fruits and vegetables as an edible vegetable ingredient.

And, the cosmetic composition may contain one or more ingredients

selected from vitamins, milk and yoghurt powder. Preferably, it may contain an edible vegetable ingredient and yoghurt powder.

The fruit and vegetable ingredient may be employed in the form of extracts or juices or crushes.

The fruit and vegetable ingredients may preferably include strawberry, apple, apricot, tomato, banana, kiwi fruit, broccoli, berries (blueberry, raspberry, etc.), potato, carrot, melon, pineapple, peach and the like. Said materials may be employed as it is without any treatment or submitted to a pre-treatment, if necessary. For example, potato may be boiled before use, and fruits may be simmered and employed with or without seeds. One skilled in this art can easily process vegetable ingredients depending on their properties.

The edible vegetable ingredient may be employed in the various forms of extracts, juices, crushes and the like. One skilled in this art, in consideration of product's feature, consumer's preference, can select this form employed. Further, it may be apparent, to those skilled in this art, to change this form, if necessary.

## **DETAILED DESCRIPTION OF THE INVENTION**

In this invention, the term "curd yoghurt" refers to a concentrated yoghurt having viscosity and exemplified as scooping yoghurt or squeezing yoghurt.

And, the term "pack formulation" in this invention refers to a formulation for forming a film on the skin, after applied thereon. Thus, preferable pack forms a temporary film on the skin, to block air inflow and moisture evaporation and to enable active ingredients contained therein to penetrate into the skin.

The pack may include a formulation to be directly applied onto the skin

or a formulation produced by coating with or applying the cosmetic composition on gauze or paper or permeable membrane such as non-woven fabric.

The pack formulation embodied by the present invention has feature of curd yoghurt and improved usability, and thereby good stickiness without trickling-down. That is, it may be convenient for use.

In production for a pack, various polymers may be employed for convenient use. These polymers may increase viscosity of a cosmetic or block destruction of emulsion particles, so as to improve stability of the emulsion. And, these polymers, depending on their properties, may have significant effects on forming texture of the emulsion.

The emulsion of the present invention has lumpy texture, i.e. feeling just as soft fleshes fall into the hands; different from general emulsions having smooth texture of whitening appearance. Nevertheless, the emulsion has good stability.

This formulation was developed by screening polymer combinations in consideration of both texture and stability.

The polymers employed herein were carbomer, polyacrylamide, polyvinyl alcohol, mannan, xanthan gum and starch, which have been widely used in general cosmetics. Polymer combinations were incorporated into emulsions and then synergic effects were compared. The results confirmed that emulsion obtained by using combination of xanthan gum and mannan exhibited similar lumpy texture to that of yoghurt and formed stable formulation.

Further, the present invention improved usability as a pack formulation by controlling combinational ratio of xanthan gum and mannan. Thus, the cosmetic composition of the present invention is characterized in that it may contain said xanthan gum and mannan each in an amount of 0.02-10% by

weight and preferably 0.2-2.0% by weight based on the total weight of composition. If the amount is less than 0.02% by weight, it may be difficult to obtain lumpy texture. While, if the amount is more than 10% by weight, it may be out of viscosity range for cosmetics.

The cosmetic curd yoghurt according to the present invention may have the same or higher viscosity than that of edible curd yoghurt. Said viscosity may be controlled depending on the purpose of cosmetic or skin type. One skilled in this art may formulate a pack with viscosity suitable for the purpose, if necessary.

Addition of starch into the combination of xanthan gum and mannan, as confirmed in the below examinational example, can improve appearance and texture of cosmetics. Starch may be incorporated in a ratio of 0-10 to 1 weight of the combination of xanthan gum and mannan.

The present invention can provide skin moisturizing and softening effects improved by further containing vegetable extracts or fruit extracts or yoghurt powder. That is to say, addition of extracts of fruits such as strawberry that are abundantly incorporated in edible curd yoghurt; or vegetable extracts; or yoghurt powder can improve skin moisturizing and softening effects. Such an addition can exhibit synergic effect in moisturizing and softening actions and realize furthermore similar fragrance and feeling to those of edible yoghurt.

Vegetables and fruits contain rich vitamins, and particularly strawberry contains rich monosaccharides including glucose and fructose, so as to refresh and animate dried and rough skin. And, yoghurt contains vitamin B2 and qualitative proteins, to be expected to provide a cosmetic effect for elastic and bright skin. Thus, the cosmetic composition according to the present invention is characterized in that it may further contain strawberry extract or yoghurt powder.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

Fig. 1 shows changes in skin hydration with the lapse of time, after applying the cosmetics of Examples 1-5 and Comparative Example 1 onto the forearm.

Fig. 2 shows changes in skin hydration with the lapse of time, after applying the cosmetic of Example 3 onto the face (brow, frontal cheek, cheek, chin).

Fig. 3 shows changes in skin hydration with the lapse of time, after applying the cosmetic of Example 4 onto the face (brow, frontal cheek, cheek, chin).

Fig. 4 shows changes in skin hydration with the lapse of time, after applying the cosmetic of Example 5 onto the face (brow, frontal cheek, cheek, chin).

## **PREFERRED EMBODIMENT OF THE INVENTION**

The present invention will be described in more detail by way of the following examples, which should not be considered to limit the scope of the present invention.

### <Experimental Example 1> Searching and screening of formulation

Emulsions were produced by combining, as shown in Table 1, polymers such as carbomer, polyacrylamide, polyvinyl alcohol, starch, xanthan gum and mannan which have been widely used in general cosmetics, and estimated for their properties.

While, in the production of the emulsions, decamethylcyclopentasiloxane, hydrogenated polydecene, vegetable squalane, cetyloctanoate, polysorbate 60, sorbitan stearate and sorbitan sesquioleate were added to an oily phase, and distilled water, glycerin and EDTA·2Na were added to an aqueous phase. The emulsions were produced by the conventional method for cosmetics.

For the emulsions produced, experiment was performed in order to confirm lumpy texture thereof.

[Table 1]

Polymer combinations (wt%)

Combination	Xanthan gum	Mannan	Carbomer	Polyacrylamide	Starch	Polyvinyl alcohol
#1	0.1	0.1	-	-	-	-
#2	0.1	-	0.1	-	-	-
#3	0.1	-	-	0.1	-	-
#4	0.1	-	-	-	1.0	-
#5	0.1	-	-	-	-	1.0
#6	-	0.1	0.1	-	-	-
#7	-	0.1	-	0.1	-	-
#8	-	0.1	-	-	1.0	-
#9	-	0.1	-	-	-	1.0
#10	-	-	0.1	0.1	-	-
#11	-	-	0.1	-	1.0	-
#12	-	-	0.1	-	-	1.0
#13	-	-	-	0.1	1.0	-
#14	-	-	-	0.1	-	1.0
#15	-	-	-	-	1.0	1.0
#16	0.2	0.1	-	-	-	-
#17	0.1	0.2	-	-	-	-
#18	0.4	0.1	-	-	-	-
#19	0.1	0.4	-	-	-	-
#20	0.1	0.1	0.1	-	-	-
#21	0.1	0.1	-	0.2	-	-
#22	0.1	0.1	-	-	2.0	-
#23	0.1	0.1	-	-	-	5.0

Meanwhile, for the emulsions containing the polymer combinations



#1-#23 of Table 1, lumpy texture thereof was compared and the results are shown in Table 2.

[Table 2]

Results of experiment for polymer combinations

Combination	Appearance and texture	Combination	Appearance and texture
#1	◎	#13	×
#2	×	#14	×
#3	×	#15	×
#4	×	#16	○
#5	×	#17	○
#6	×	#18	○
#7	×	#19	○
#8	×	#20	○
#9	×	#21	○
#10	×	#22	◎
#11	×	#23	×
#12	×		

(Note, ◎ : lumpy, ○ : slight lumpy, × : No lumpy)

As shown in Table 2, lumpy texture was observed in the compositions containing combinations of xanthan gum and mannan.

Further, in the observation of appearance and texture depending on a combinational ratio of xanthan gum and mannan, combination #1 had the most similar appearance and texture to those of curd yoghurt. For all that, most of emulsions containing the combinations of xanthan gum and mannan had lumpy texture.

The combinations #20-#23 further contained other polymer together with xanthan gum and mannan, in order to improve usability to the skin. Among

them, the combination #22 was the most satisfactory in appearance and texture.

<Examples 1-5 and Comparative Example 1>

Based on the results of Experimental Example 1, the combination of xanthan gum and mannan was added to an oil-in-water emulsion. Added amount of the combination was 0.6% by weight based on the total weight of composition, and weight ratio of xanthan gum : mannan was 1:1(in Example 1 and Examples 3~5) and 2:1(in Example 2). The compositions thereof were shown in Table 3.

In detail, in order to confirm effect of the combination of xanthan gum and mannan in the appearance and texture, the combination was not added to the emulsion of Comparative Example 1. Further, in order to confirm skin-moisturizing effect of the emulsion containing fruit extract together with yoghurt powder, Example 3, Example 4 and Example 5 containing strawberry extract, banana extract and carrot extract, respectively were produced and the skin-moisturizing effect thereof was compared (See Table 3). In the examples, the strawberry, banana and carrot extracts (Bioland ltd. Korea) and yoghurt powder (Cosmetochem, Switzerland) were on the market.

The extracts and powder are not limited in the kinds and the processing by the present examples and can be directly produced in consideration of the purpose and the usage thereof by those skilled in this art. For example, yoghurt powder can be produced by sterilizing low-fat yoghurt or other kind of yoghurt depending on skin type and then by drying and pulverizing. And, fruits or vegetables can be treated fitting to formulation.

The following Table 3 relates to oil-in-water (O/W) emulsions and unit is % by weight (wt%).

Examples 1-5 and Comparative Example 1 were produced by the

following method.

<Preparation Method>

(1) Oily phase was heated to 70-75 °C and homogenized.

(2) Aqueous phase 1 was heated to 70-75 °C to be dissolved and homogenized.

(3) Said (1) was added to said (2) under stirring and at the temperature of 70-75 °C and sequentially aqueous phase 2 was added and then cooled to 28-30 °C.

[Table 3]

	Materials	Ex. 1	Ex. 2	Ex. 3	Ex. 4	Ex. 5	Comp. Ex. 1
Oily phase	Cetyloctanoate	4.0	4.0	4.0	4.0	4.0	4.0
	Hydrogenated polydecene	4.0	4.0	4.0	4.0	4.0	4.0
	Vegetable squalane	3.0	3.0	3.0	3.0	3.0	3.0
	Polysorbate 60	1.20	1.20	1.20	1.20	1.20	1.20
	Sorbitan stearate	0.30	0.30	0.30	0.30	0.30	0.30
	Sorbitan sesquioleate	0.50	0.50	0.50	0.50	0.50	0.50
	Preservative	0.2	0.2	0.2	0.2	0.2	0.2
	Perfume	0.05	0.05	0.05	0.05	0.05	0.05
Aqueous phase 1	Distilled water	to 100	to 100	to 100	to 100	to 100	to 100
	Glycerin	4.0	4.0	4.0	4.0	4.0	4.0
	Butylene glycol	6.0	6.0	6.0	6.0	6.0	6.0
	EDTA·2Na	0.02	0.02	0.02	0.02	0.02	0.02
	Sucrose	0.4	0.4	0.4	0.4	0.4	0.4
	Xanthan gum	0.3	0.4	0.3	0.3	0.3	-
	Mannan	0.3	0.2	0.3	0.3	0.3	-
	Yoghurt powder	-	-	0.05	0.05	0.05	-
	Strawberry extract	-	-	20.0	-	-	-
	Banana extract	-	-	-	20.0	-	-
	Carrot extract	-	-	-	-	20.0	-
	Preservative	0.2	0.2	0.2	0.2	0.2	0.2
Aqueous phase 2	Starch	-	-	2.5	2.0	1.0	2.5

Appearance and texture of Examples 1-5 and Comparative Example 1 are shown in Table 4. Among them, Examples 1 and 3-5 had the most similar

appearance and texture to those of curd yoghurt.

[Table 4]

Test samples	Appearance and texture
Example 1	◎
Example 2	○
Example 3	◎
Example 4	◎
Example 5	◎
Comparative Example 1	×

(Note, ◎ : lumpy, ○ : slight lumpy, × : No lumpy)

#### <Experimental Example 2> Evaluation for skin hydration

Skin hydration was evaluated by each fifteen (15) of females and males complaining or having dry skin. They stayed in an incubator of 24-26℃ and relative humidity 40-50%, for one hour. Then, on their forearms, the cosmetics of Examples 1-5 and Comparative Example 1 were applied and skin hydration was compared. Before and 0, 4, 6 or 24 hours later after application, skin hydration was measured by Corneometer (Courage & Khazaka, Germany). The results are shown in Fig. 1.

In a separate way, the cosmetics of Examples 3-5 were applied onto the faces of the subjects, i.e. brows, front cheeks, cheeks and chins. Before and 0, 4, 6 or 24 hours later after application, skin hydration was measured by Corneometer. Herein, the term “front cheek” refers to the front of cheek, on eyes fronting forward, while “cheek” refers to the side of cheek.

The results are shown in Figs. 2-4.

Further, when the test was completed, the subjects were answered to the questions, to perform subjective evaluation, apart from mechanical evaluation.

The results are shown in Table 5. The questions were divided to four grades: Very Good; Good; Average; and Unsatisfactory.

[Table 5]

Answer to the questions for skin-moisturizing effect

Test samples	Number of the subjects showing response			
	Very good	Good	Average	Unsatisfactory
Example 1	2	7	4	2
Example 2	2	7	5	1
Example 3	6	5	3	1
Example 4	6	7	1	1
Example 5	5	6	3	1
Comparative Example 1	1	7	6	1

The results of Fig. 1 indicated that the cosmetics of Examples 3-5 had relatively higher value in skin hydration after application thereof than the cosmetics of Examples 1 and 2. Further, as shown in Figs. 2-4, after application of each cosmetic of Examples 3-5 onto the face, skin hydration increased with the lapse of time. This increase in skin hydration was continuously observed 24 hours later.

These results were confirmed by answering to the questions. As shown in Table 5, the cosmetics of Examples 3-5 containing fruit and vegetable extracts were relatively excellent in skin moisturizing.

As described above, the present invention relates to a cosmetic composition with appearance and texture of curd yoghurt, which is realized by incorporating xanthan gum and mannan. The cosmetic composition can be formulated into a pack. In addition, the present invention can provide skin hydration increased by further containing fruit or vegetable extracts or yoghurt

powder, so as to provide improved skin moisturizing effect.